

UNITED STATES NAVAL OBSERVATORY
CIRCULAR NO. 35

U. S. Naval Observatory, Washington 25, D. C.

March 14, 1952

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS

OCTOBER-NOVEMBER-DECEMBER, 1951

By Lucy T. Day

These results are based upon measurements made at the Naval Observatory on plates secured either there or at the Mt. Wilson Observatory. The symbols used for the entries in the successive columns are as follows:

U.T., the epoch of observation in Universal Time.

No., the identifying number of the group assigned by Mt. Wilson.

Δl , the heliographic difference in longitude from the central meridian, measured positive to the west.

φ , the heliographic latitude, measured positive to the north.

ρ , the heliocentric angular distance from the line joining the centers of the Earth and Sun.

A , the true area of the umbra plus penumbra, expressed in millionths of the visible hemisphere.

s , the number of spots.

An asterisk means that no Mt. Wilson number was assigned. Plates secured at the Naval Observatory are indicated by N, and those at Mt. Wilson by W. The plate quality, which follows, is indicated by:

1, Poor; 2, Fair; 3, Good; 4, Very Good; 5, Excellent.

The following five quantities are listed successively at the end of each day, and give for that day:

1. The total number of groups, g .
2. The longitude of the central meridian, L_0 .
3. The latitude of the center of the disc, B_0 .
4. The total value of A .
5. The total value of s .

The mean daily area and the mean relative sunspot number, $r=10g+s$ are given at the end of the month.

These results are a continuation of those published in the *Monthly Weather Review* from February 1, 1927 to December 31, 1947.

OCTOBER

U.T.	No.	Δl	ϕ	ρ	A	s
1.658	10793	-68	-3	68	291	1
N-3	10792	+8	+9	8	97	6
	10792	+11	+9	11	109	5
	10791	+22	+19	25	16	9
	10791	+27	+20	30	24	1
	(3)	(53)	(+7)		537	22
2.647	10793	-54	-3	55	291	1
N-3	10792	+22	+9	22	158	14
	10792	+23	+8	23	16	3
	10792	+25	+9	28	145	8
	10791	+39	+20	40	24	1
	(3)	(40)	(+7)		634	27
3.642	10793	-40	-4	42	315	1
N-3	10792	+35	+9	35	218	6
	10792	+39	+9	39	121	8
	10791	+54	+20	54	24	1
	(3)	(27)	(+7)		678	16
4.722	10793	-27	-4	30	242	1
N-2	10792	+49	+8	49	145	5
	10792	+53	+8	53	97	4
	10791	+68	+19	68	16	1
	(3)	(13)	(+7)		500	11
5.665	10793	-14	-4	16	242	1
N-3	10792	+65	+7	65	145	8
	(2)	(0)	(+7)		387	9
6.628	10793	-1	-4	10	242	1
N-2	10792	+76	+7	76	48	1
	(2)	(348)	(+6)		290	2
7.624	10793	+13	-4	16	218	1
W-2						
	(1)	(335)	(+6)		218	1
8.649	10797	-80	-15	80	24	1
N-3	10796	-75	-10	78	582	1
	10795	-72	+9	72	48	1
	10794	-43	+11	43	12	1
	10793	+26	-5	27	218	1
	(5)	(321)	(+6)		884	5
9.696	10797	-68	-14	71	36	1
W-3	10797	-64	-15	68	61	5
	10795	-65	+9	65	73	11
	10795	-59	+11	59	6	1
	10795	-59	+8	59	61	4
	10795	-57	+9	57	48	15
	10796	-63	-10	65	36	5
	10796	-61	-10	63	485	1
	10794	-29	+11	29	16	3
	10799	-14	+4	15	48	12
	10798	+19	-4	22	12	2
	10793	+40	-5	42	218	1

U.T.	No.	Δl	ϕ	ρ	A	s
	(7)	(307)	(+6)		1100	61
10.734	10800	-80	+11	80	242	1
W-2	10796	-54	-7	56	24	4
	10796	-49	-8	51	36	3
	10796	-48	-11	51	48	2
	10796	-47	-10	50	485	1
	10797	-50	-15	55	24	2
	10795	-49	+9	49	97	10
	10795	-45	+9	45	73	6
	10799	-2	+4	2	12	3
	10798	+34	-4	35	6	1
	10793	+53	-5	55	218	1
	(7)	(294)	(+6)		1265	34
11.775	10800	-65	+11	65	315	1
N-2	10797	-40	-15	42	145	4
	10797	-38	-15	43	73	2
	10797	-37	-15	42	12	1
	10795	-36	+9	36	194	4
	10795	-31	+9	31	97	6
	10796	-33	-9	36	24	6
	10796	-32	-9	35	582	1
	10801	+14	-10	22	16	3
	10798	+49	-3	51	36	2
	10793	+67	-5	68	218	1
	(7)	(280)	(+6)		1712	31
12.662	10800	-53	+11	53	242	1
N-3	10797	-32	-16	38	73	2
	10797	-24	-16	32	97	8
	10795	-24	+9	24	73	4
	10795	-19	+10	20	36	5
	10796	-23	-10	28	24	3
	10796	-21	-10	26	582	1
	10798	+58	-4	59	48	1
	10798	+63	-5	64	48	1
	10793	+80	-6	80	194	1
	(6)	(268)	(+6)		1417	27
13.649	10800	-40	+12	40	218	1
N-3	10797	-17	-15	27	73	7
	10797	-11	-15	25	73	5
	10795	-11	+9	11	24	2
	10795	-7	+10	8	24	4
	10796	-11	-11	21	73	3
	10796	-8	-9	17	582	1
	10798	+73	-4	74	48	1
	(5)	(255)	(+6)		1115	24
14.754	10800	-25	+11	26	218	1
N-2	10796	-5	-11	18	61	2
	10796	+7	-9	17	582	1
	10797	-1	-15	21	48	1
	10797	+5	-15	22	36	3
	10795	+1	+8	3	12	1
	10795	+5	+9	5	12	1
	10795	+9	+9	9	24	1
	(4)	(241)	(+6)		993	11

OCTOBER

U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s
		°	°	°					°	°	°		
15.647	10800	-12	+11	13	206	1	21.628	10803	+38	+9	38	61	9
N-3	10797	+11	-17	26	48	8	W-2	10803	+43	+9	43	12	3
	10797	+18	-16	28	145	12		10803	+47	+9	47	97	3
	10796	+17	-11	23	97	4		10800	+67	+11	67	194	1
	10796	+20	-9	24	630	1		(2) (150)	(+5)			364	16
	10795	+21	+9	22	24	7							
	(4) (229)	(+6)			1150	33	22.618	10803	+53	+9	53	48	4
16.647	10800	-1	+11	5	48	4	W-2	10803	+54	+10	54	12	1
N-3	10800	+1	+11	5	206	1		10803	+60	+10	60	16	1
	10797	+24	-18	33	36	1		10803	+62	+8	62	97	2
	10797	+33	-16	40	194	13		10800	+80	+11	80	194	1
	10797	+38	-16	44	24	3		(2) (137)	(+5)			367	9
	10796	+29	-14	34	48	7							
	10796	+32	-9	35	630	1							
	(3) (216)	(+6)			1186	30	23.656	10807	-58	+7	58	6	2
17.658	10800	+14	+11	14	194	1	N-2	10803	+77	+7	77	12	1
N-3	10797	+37	-18	44	24	1		10803	+79	+7	79	48	1
	10797	+43	-16	49	145	3		(2) (123)	(+5)			66	4
	10797	+47	-15	50	61	3							
	10797	+52	-16	57	48	1	24.665	10807	-47	+7	47	36	1
	10796	+42	-12	46	218	9	N-2	10807	-42	+7	42	48	1
	10796	+45	-9	47	485	1		(1) (110)	(+5)			84	2
	(*)	+51	-19	58	12	2							
	(4) (202)	(+6)			1187	21	25.651	10809	-87	-9	87	242	1
18.642	10804	-70	+17	70	73	1	N-2	10808	-68	-12	70	12	1
N-3	10804	-65	+17	65	36	1		10807	-34	+8	34	12	1
	(*)	-11	+7	11	12	1		10807	-29	+6	29	24	2
	(*)	-7	+7	7	12	1		(3) (97)	(+5)			290	5
	10800	+25	+11	26	12	1							
	10800	+26	+11	27	194	1	26.674	10809	-80	-9	80	145	4
	10796	+55	-11	58	170	3	N-3	10809	-70	-8	71	339	1
	10796	+59	-9	61	582	1		10811	-80	+10	80	145	3
	10797	+57	-16	61	242	3		10811	-78	+12	78	145	1
	10797	+62	-16	63	48	4		10808	-55	-12	57	12	1
	(6) (189)	(+6)			1381	17		10807	-16	+7	16	6	1
19.656	10804	-56	+17	57	73	4		10807	-13	+6	14	12	1
W-3	10803	+13	+9	14	73	4		10810	+11	+8	12	12	1
	10803	+15	+10	16	73	1		10810	+13	+8	14	12	1
	10803	+15	+7	15	36	13		(5) (83)	(+5)			828	14
	10803	+19	+9	19	97	5							
	10800	+41	+11	41	194	1	27.658	10813	-82	-6	82	145	1
	10796	+69	-8	70	73	4	N-3	10809	-70	-13	72	145	2
	10796	+71	-10	73	582	1		10809	-68	-11	69	121	2
	10796	+73	-9	75	97	1		10809	-66	-12	67	121	3
	10797	+73	-16	77	194	6		10809	-57	-11	60	257	1
	10797	+80	-15	80	97	1		10809	-55	-11	57	194	1
	(5) (176)	(+6)			1589	41		10809	-52	-11	54	145	4
20.624	10805	-6	+10	8	24	5		10809	-49	-11	52	61	3
W-2	10803	+27	+9	27	61	10		10811	-63	+10	63	194	1
	10803	+28	+9	28	24	1		10808	-44	-11	46	24	1
	10803	+29	+7	29	24	4		10808	-42	-13	45	24	4
	10803	+33	+8	33	145	6		10807	+1	+6	1	12	2
	10800	+54	+11	54	194	1		10812	+13	+18	18	12	2
	10796	+87	-9	87	291	1		10810	+28	+8	28	12	1
	(4) (163)	(+5)			763	28		(7) (70)	(+5)			1467	28
							28.789	10813	-68	-6	69	97	1
							N-3	10809	-58	-13	60	145	1

OCTOBER. NOVEMBER

U.T.	No.	Δi	φ	ρ	A	s	U.T.	No.	Δi	φ	ρ	A	s	
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$			
	10809	-55	-10	57	48	1	1.658	10813	-15	-5	17	12	1	
	10809	-54	-12	56	48	11	W-2	10809	-3	-10	14	145	15	
	10809	-48	-10	51	170	3		10809	+7	-9	15	48	6	
	10809	-46	-9	47	145	4		10809	+8	-9	16	170	1	
	10809	-44	-10	46	242	1		10809	+8	-6	13	36	3	
	10809	-39	-10	42	170	1		10809	+10	-9	17	97	7	
	(*)	-51	+7	51	6	1		10809	+12	-9	17	109	2	
	10811	-49	+11	49	145	1		10811	+2	+12	9	73	1	
	10812	+25	+19	29	12	5		10814	+47	+13	48	24	1	
	10810	+40	+7	40	48	5		10814	+50	+11	51	24	6	
	10810	+44	+7	44	61	6								
	(6)	(55)	(+5)		1337	41		(4)	(4)	(+4)		738	43	
29.660	10813	-56	-6	58	61	1	2.660	10815	-3	+19	16	6	1	
N-3	10809	-45	-12	48	97	1	W-2	10809	+11	-9	17	48	7	
	10809	-42	-12	45	48	4		10809	+12	-11	19	36	13	
	10809	-42	-9	44	73	3		10809	+19	-11	24	24	10	
	10809	-37	-9	41	48	2		10809	+21	-9	25	170	1	
	10809	-34	-9	35	170	7		10809	+25	-10	28	61	11	
	10809	-32	-9	34	242	1		10809	+27	-13	32	6	1	
	10809	-29	-7	33	12	3		10809	+28	-10	32	97	1	
	10809	-28	-9	32	145	1		10811	+15	+12	17	73	1	
	10811	-40	+11	40	73	3		10814	+61	+13	61	24	1	
	10811	-38	+11	38	97	1		10814	+65	+10	65	16	3	
	(*)	+9	+10	11	6	3								
	10810	+50	+8	50	73	6		(4)	(351)	(+4)		561	50	
	10810	+57	+7	57	61	2								
	(5)	(44)	(+5)		1206	38		3.735	10817	-84	-13	84	388	1
30.665	10813	-43	-6	45	48	1	N-2	10809	+25	-9	27	73	4	
W-3	10809	-32	-11	35	48	1		10809	+35	-10	36	97	1	
	10809	-29	-11	33	48	15		10809	+40	-11	43	48	1	
	10809	-28	-9	32	48	1		10809	+42	-11	44	73	1	
	10809	-24	-9	27	12	1		10811	+29	+12	31	61	2	
	10809	-20	-9	25	61	2		10814	+78	+11	78	12	1	
	10809	-18	-9	23	218	1		(4)	(337)	(+4)		752	11	
	10809	-17	-8	22	97	10								
	10809	-14	-9	18	145	1		4.685	10818	-80	-5	80	109	1
	10811	-27	+13	28	24	4	N-3	10818	-78	-7	78	218	1	
	10811	-25	+12	26	97	1		10817	-70	-11	71	533	1	
	10810	+64	+8	64	73	4		10816	-60	-9	61	48	1	
	10810	+70	+7	70	145	5		10809	+38	-9	42	48	1	
	(4)	(31)	(+5)		1064	47		10809	+49	-11	51	121	2	
31.655	10813	-30	-6	33	48	1		10809	+55	-12	56	48	2	
N-3	10809	-19	-12	25	48	1		10811	+43	+12	44	48	1	
	10809	-17	-11	23	61	1		(5)	(325)	(+4)		1173	10	
	10809	-17	-13	25	73	6								
	10809	-11	-11	19	6	1		5.651	10818	-77	-5	77	97	2
	10809	-8	-11	18	73	3	N-3	10818	-68	-6	68	97	1	
	10809	-7	-10	16	145	1		10818	-65	-5	66	12	2	
	10809	-3	-10	13	97	10		10818	-64	-7	65	388	2	
	10809	0	-11	15	145	1		10817	-58	-12	60	533	1	
	10811	-11	+11	13	73	1		10816	-47	-10	49	12	1	
	10810	+80	+8	80	48	1		10809	+50	-10	52	36	2	
	10810	+85	+7	85	97	1		10809	+52	-12	54	145	13	
	(4)	(18)	(+4)		914	28		10809	+63	-12	65	97	1	
								10809	+65	-12	67	12	6	
								10811	+56	+12	57	36	1	
								(5)	(312)	(+4)		1465	32	
								6.648	10818	-63	-5	63	97	2
								N-2	10818	-54	-6	55	97	2
									</					

Mean for 31 days
 $A=870$, $r=62.3$

NOVEMBER

U.T.	No.	Δl	ϕ	ρ	A	s	U.T.	No.	Δl	ϕ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	10818	-50	-7	52	388	2		10817	+22	-13	27	436	1
	10817	-44	-12	46	585	1		10817	+23	-15	29	16	10
	10809	+60	-13	62	48	1		10823	+47	+17	49	24	4
	10809	+63	-13	65	109	1		(6) (233) (+3)				971	39
	10811	+69	+12	69	24	1							
	(4) (299) (+4)				1348	10	12.699	10821	+8	+9	11	48	4
7.785	10818	-48	-5	50	48	1	N-2	10821	+13	+8	13	24	1
N-2	10818	-38	-5	40	97	1		10821	+16	+9	17	36	1
	10818	-36	-7	38	388	2		10818	+30	-9	33	291	4
	10817	-29	-12	33	585	1		10817	+36	-13	39	339	3
	(2) (284) (+4)				1118	5		10823	+60	+17	61	73	1
8.705	10821	-43	+11	44	12	2		(4) (219) (+3)				811	14
N-3	10818	-28	-5	31	12	1	13.660	10821	+23	+8	23	48	8
	10818	-26	-5	27	48	1	W-2	10818	+43	-9	44	291	3
	10818	-25	-6	27	24	7		10817	+48	-11	50	12	1
	10818	-24	-7	26	388	3		10817	+49	-13	51	194	1
	10817	-17	-12	23	585	1		10817	+53	-13	56	12	4
	10817	-15	-16	25	48	3		10823	+73	+17	73	24	3
	10817	-14	-12	22	24	1		(4) (206) (+3)				581	20
	10820	-12	+10	12	12	1	14.782	10826	+12	-2	12	16	1
	10820	-8	+12	12	12	1	W-2	10825	+30	-4	31	61	3
	(4) (272) (+4)				1165	21		10825	+32	-5	33	48	5
9.645	10822	-41	-8	43	16	5		10818	+57	-10	59	12	3
N-3	10821	-32	+9	33	6	1		10818	+58	-9	60	291	3
	10821	-30	+10	31	12	2		10817	+67	-13	69	194	1
	10821	-28	+9	29	12	4		(4) (191) (+3)				622	16
	10818	-21	-6	23	12	7	15.647	10827	-31	+7	31	24	3
	10818	-16	-5	18	12	2	W-2	10826	+23	-2	24	12	1
	10818	-13	-6	17	73	3		10825	+41	-4	42	61	3
	10818	-11	-7	16	388	3		10825	+45	-4	46	48	1
	10817	-8	-16	22	48	2		10818	+70	-8	70	291	3
	10817	-5	-12	17	436	2		10817	+79	-13	79	194	1
	10817	-3	-17	22	12	2		(5) (180) (+3)				630	12
	10817	-1	-13	17	12	5	16.705	10828	-74	+17	74	218	1
	(4) (259) (+4)				1039	38	N-2	10827	-16	+7	17	36	1
10.708	10822	-28	-8	32	6	2		10825	+54	-4	55	73	1
N-2	10821	-19	+9	20	24	2		10825	+61	-4	62	24	1
	10821	-15	+9	16	48	2		10818	+85	-8	85	242	2
	10821	-15	+7	15	48	1		(4) (166) (+3)				593	6
	10821	-3	+7	6	48	1	17.713	10831	-79	+21	79	194	2
	10818	+1	-7	10	36	3	N-2	10828	-74	+19	74	97	2
	10818	+3	-7	11	436	5		10828	-61	+18	62	194	3
	10817	+9	-13	18	436	1		(*)	-67	+11	68	12	1
	10817	+11	-13	19	48	7		10830	-56	+10	56	24	1
	(4) (245) (+3)				1130	24		10830	-52	+10	52	36	2
11.644	10822	-14	-9	17	12	3		10829	-49	+7	49	12	1
N-3	10824	-13	+10	14	12	4		10827	-5	+7	6	24	2
	10821	-5	+8	7	12	1		10827	-1	+7	4	36	2
	10821	-3	+10	8	12	1		10825	+68	-3	68	12	1
	10821	-1	+8	5	24	1		(7) (153) (+3)				641	17
	10821	+1	+7	4	12	1	18.819	10831	-63	+21	64	194	1
	10818	+14	-7	17	24	2	N-2	10828	-60	+18	61	61	1
	10818	+15	-8	18	36	7							
	10818	+17	-9	22	339	3							
	10817	+21	-12	26	12	1							

NOVEMBER

U. T.	No.	Δl	φ	ρ	A	s	U. T.	No.	Δl	φ	ρ	A	s	
	10828	-47	+18	48	97	1		10829	+60	+ 3	60	16	2	
	10830	-41	+ 9	41	48	1		(7)	(47)	(+2)		765	21	
	10830	-36	+ 9	36	48	1		26.669	10834	-62	+11	62	145	1
	10829	-33	+ 7	33	6	1	N-2	10834	-57	+12	58	48	2	
	10827	+ 9	+ 6	10	24	1		10834	-55	+11	56	107	2	
	10827	+14	+ 7	15	36	1		10832	-34	+11	35	107	1	
(5)	(138)	(+3)			514	8		10832	-31	+10	32	24	4	
19.645	10831	-51	+21	54	207	1		10835	+36	+ 4	36	48	4	
N-3	10828	-48	+18	51	48	1		10835	+39	+ 6	39	36	1	
	10828	-35	+18	48	121	1		10831	+39	+21	43	194	1	
	10830	-30	+10	31	24	1		10833	+41	-16	44	12	1	
	10830	-25	+ 9	26	97	1		10830	+67	+ 8	67	145	1	
	10827	+23	+ 7	23	12	1		10829	+73	+ 3	73	12	1	
	10827	+25	+ 7	25	61	2		(7)	(35)	(+2)		878	19	
(4)	(127)	(+2)			570	8		27.776	10836	-68	+13	68	12	2
20.698	10831	-39	+21	42	207	1	N-2	10834	-47	+ 9	47	73	4	
N-3	10828	-24	+17	28	97	1		10834	-39	+10	40	109	2	
	10830	-18	+ 9	20	73	2		10832	-19	+10	21	73	1	
	10830	-15	+ 9	16	48	1		10832	-17	+ 9	19	36	2	
	10830	-11	+ 8	13	145	1		10832	-15	+ 8	16	36	1	
	10827	+37	+ 6	37	24	5		10835	+51	+ 4	51	121	1	
(4)	(113)	(+2)			594	11		10835	+55	+ 6	55	97	1	
21.645	10831	-26	+21	32	207	1		10831	+53	+21	55	145	1	
N-2	10828	-11	+17	18	48	1		10830	+80	+ 8	80	145	1	
	10828	-10	+17	18	73	1		(6)	(20)	(+1)		847	16	
	10830	+ 2	+ 8	6	194	1		28.719	10836	-54	+14	55	12	1
(3)	(101)	(+2)			522	4	W-2	10834	-33	+10	34	24	6	
23.635	10832	-75	+ 9	75	121	1		10834	-25	+10	26	61	5	
N-3	10831	0	+21	19	207	1		10832	- 5	+10	11	73	1	
	10828	+15	+17	21	24	2		10832	- 4	+11	11	24	3	
	10828	+16	+16	21	73	2		10832	- 2	+ 8	8	16	1	
	10830	+28	+ 8	29	145	1		10835	+64	+ 5	64	170	3	
	10829	+31	+ 3	31	36	2		10835	+65	+ 3	65	145	4	
(5)	(75)	(+2)			606	9		10835	+65	+ 8	65	97	1	
24.666	10832	-60	+10	60	145	1		10835	+68	+ 7	68	242	5	
W-3	10832	-59	+ 9	59	36	2		10831	+67	+21	67	145	1	
	10833	+13	-13	20	12	1		(5)	(8)	(+1)		1009	31	
	10833	+15	-14	22	48	2		29.653	10837	-64	+ 7	64	48	1
	10831	+14	+21	23	194	1	N-2	10837	-60	+ 5	60	48	1	
	10828	+31	+17	33	12	2		10834	-15	+10	17	109	3	
	10828	+34	+16	36	48	3		10832	+ 7	+10	12	61	1	
	10830	+40	+ 8	41	16	7		10835	+75	+ 5	75	194	1	
	10830	+42	+ 8	43	109	1		10835	+76	+ 3	76	97	1	
(5)	(61)	(+2)			620	20		10835	+78	+ 7	78	242	2	
25.692	10834	-75	+11	75	145	2		10831	+79	+21	79	194	1	
W-2	10834	-68	+14	68	48	5		(5)	(355)	(+1)		993	11	
	10832	-48	+10	49	109	4		30.649	10837	-46	+ 5	46	61	2
	10832	-42	+11	43	24	1	N-2	10834	- 2	+10	9	48	2	
	10832	-39	+11	40	36	3		10832	+20	+10	22	73	2	
	10833	+28	-15	33	36	1		10832	+23	+ 9	23	48	1	
	10831	+29	+21	33	170	1		10832	+25	+ 8	26	48	1	
	10828	+45	+17	47	36	1		(3)	(342)	(+1)		278	8	
	10830	+54	+ 8	55	145	1								

Mean for 29 days
 $A=812$, $r=64.3$

DECEMBER

U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s
1.623	10838	-75	-15	76	16	2							
N-2	10838	-62	-15	64	24	3		10846	+6	+7	10	73	1
	10834	+9	+10	13	12	2		10841	+84	-11	84	97	1
	10834	+12	+10	15	12	3		(2) (210)	(0)			266	9
	10832	+33	+11	34	48	2	11.667	10846	+15	+8	17	61	2
	10832	+38	+8	39	48	2	N-2	10846	+20	+7	22	73	1
(3) (329)	(+1)				160	14	(1) (197)	(0)				134	3
2.628	10838	-63	-13	65	6	1	12.645	10846	+33	+7	34	61	1
N-3	10838	-62	-15	63	36	1	N-2						
	10832	+45	+11	46	36	1	(1) (184)	(-1)				61	1
	10832	+49	+9	49	24	6	13.656	10846	+47	+7	48	61	1
(2) (316)	(+1)				102	9	N-2	10845	+58	-5	58	61	1
3.738	10838	-47	-14	49	48	1		10845	+60	-5	60	24	2
N-2	10832	+62	+9	62	61	2	(2) (171)	(-1)				146	4
(2) (302)	(+1)				109	3	14.697	10848	-78	+8	79	291	2
4.700	10838	-35	-15	38	24	2	W-1	10846	+62	+7	63	36	1
N-2	10832	+75	+9	75	291	2		10845	+72	-5	72	61	1
	10832	+78	+7	78	242	1		10845	+74	-5	74	48	1
(2) (289)	(+1)				557	5	(3) (157)	(-1)				436	5
5.762	10839	-78	-5	78	61	5	15.624	10849	-75	+10	76	194	3
N-2	10840	-27	-6	28	24	2	W-3	10849	-72	+12	74	242	4
(2) (275)	(0)				85	7		10849	-68	+12	70	267	7
6.653	10839	-66	-5	66	48	1		10848	-65	+12	67	97	11
N-2	10841	+20	-10	22	36	4		10848	-64	+12	66	16	1
	10841	+23	-15	27	12	1		10851	-17	-5	17	16	7
	10841	+25	-14	29	48	4		10850	+53	-3	53	16	2
(2) (263)	(0)				144	10		10850	+55	-4	55	24	2
7.685	10839	-52	-5	52	48	4		10846	+75	+7	76	12	1
N-3	10840	-2	-9	9	16	2	(5) (145)	(-1)				884	38
	10843	+3	-14	15	24	1	16.652	10849	-62	+8	63	267	5
	10842	+20	-15	25	12	1	W-3	10849	-58	+9	59	364	6
	10842	+24	-13	27	48	1		10849	-57	+11	58	48	3
	10841	+35	-15	37	61	4		10849	-55	+9	56	194	1
	10841	+39	-13	41	97	2		10849	-55	+7	56	24	8
(5) (250)	(0)				306	15		10852	-55	-12	55	6	1
8.742	10839	-37	-5	37	48	4		10848	-51	+8	52	73	12
W-1	10845	-10	-5	12	24	1		10848	-47	+10	48	24	1
	10845	-8	-5	10	36	2		10850	+70	-4	70	12	1
	10840	+12	-8	14	24	1	(4) (131)	(-1)				1012	38
	10843	+16	-14	21	16	1	17.724	10849	-49	+5	49	12	1
	10842	+37	-13	40	24	1	W-2	10849	-49	+9	50	24	1
	10841	+50	-12	51	48	1		10849	-48	+7	49	291	1
	10841	+55	-10	56	121	1		10849	-47	+8	48	48	1
(6) (236)	(0)				341	12		10849	-44	+8	45	339	1
9.733	10841	+63	-12	64	48	1		10849	-41	+9	42	194	1
W-1	10841	+71	-10	71	97	1		10852	-42	-12	43	48	4
(1) (223)	(0)				145	2		10852	-38	-12	40	61	3
10.715	10846	+1	+8	8	48	4		10848	-37	+9	38	61	8
N-2	10846	+4	+7	8	48	3		10848	-34	+10	35	24	2
							(3) (117)	(-1)				1102	23
							19.653	10849	-21	+9	23	388	6
							N-3	10849	-19	+9	21	194	9

DECEMBER

U.T.	No.	Δl	φ	ρ	A	s	U.T.	No.	Δl	φ	ρ	A	s
		$^{\circ}$	$^{\circ}$	$^{\circ}$					$^{\circ}$	$^{\circ}$	$^{\circ}$		
	10849	-15	+10	18	291	5							
	10849	-14	+10	18	194	3							
	10849	-12	+7	14	48	10			(4)	(36)	(-2)	1368	29
	10852	-14	-12	18	61	4	24.651	10849	+42	+10	43	121	1
	10852	-7	-12	13	61	2	N-3	10849	+43	+12	45	194	7
	10848	-6	+9	12	48	4		10849	+45	+13	46	48	2
	10848	-3	+8	9	24	4		10849	+50	+10	52	776	6
	(3)	(92)	(-1)		1309	48		10849	+50	+7	51	24	2
20.737	10849	-8	+9	13	533	8		10848	+60	+10	61	61	1
W-2	10849	-4	+8	11	267	4		10848	+65	+9	66	24	7
	10849	0	+8	10	218	1		10853	+71	+4	71	61	3
	10849	+2	+8	10	194	3		10853	+76	+3	76	24	2
	10852	0	-12	10	24	2		(3)	(26)	(-2)		1333	31
	10852	+8	-12	12	48	1	26.695	10856	-58	+3	58	61	3
	10848	+8	+9	13	24	7	N-2	10855	+70	+13	71	145	2
	10848	+12	+8	16	36	5		10849	+70	+9	70	73	1
	10853	+21	+4	22	24	2		10849	+78	+9	78	191	1
	10853	+23	+3	24	48	4		10849	+80	+10	80	388	2
	10853	+27	+3	28	16	1		(3)	(359)	(-2)		858	9
	(4)	(78)	(-2)		1432	38	27.686	10856	-49	+2	49	194	6
21.681	10849	+5	+10	13	533	9	N-2	10856	-48	+3	48	12	1
N-2	10849	+9	+10	15	436	7		10856	-47	+3	47	97	4
	10849	+12	+9	17	291	1		10856	-44	+2	44	194	5
	10849	+13	+10	18	145	1		(1)	(346)	(-2)		497	16
	10852	+21	-12	23	48	2	28.651	10856	-38	+3	38	339	2
	10853	+32	+5	33	48	2	N-2	10856	-35	+1	35	48	1
	10853	+37	+4	38	61	3		10856	-34	+3	35	194	1
	(3)	(65)	(-2)		1562	25		10856	-31	+3	32	194	1
22.710	10849	+18	+9	21	436	7		(1)	(333)	(-3)		775	5
N-2	10849	+18	+7	21	48	1	29.634	10856	-24	+2	25	242	5
	10849	+22	+9	24	436	4	N-2	10856	-22	+4	23	36	1
	10849	+25	+9	27	339	1		10856	-21	+2	22	24	1
	10852	+34	-12	35	48	1		10856	-18	+2	20	327	3
	10853	+45	+6	46	36	1		(1)	(320)	(-3)		629	10
	10853	+48	+5	48	48	1	31.691	10859	-68	-21	69	48	3
	10853	+50	+4	50	97	3	N-2	10859	-62	-19	63	73	3
	(3)	(52)	(-2)		1488	19		10857	-11	+15	20	61	2
23.871	10854	+23	+9	26	48	2		10857	-5	+15	18	97	2
W-1	10849	+34	+7	35	48	1		10856	+3	+3	6	121	14
	10849	+34	+9	36	339	6		10856	+6	+3	8	36	4
	10849	+36	+8	37	73	7		10856	+11	+2	12	364	5
	10849	+40	+9	41	679	5		(3)	(293)	(-3)		800	33
	10849	+42	+8	43	24	2							
	10848	+50	+8	51	36	1							
	10848	+55	+7	55	48	1							
	10853	+62	+4	62	61	3							
	10853	+68	+3	68	12	1							

Mean for 28 days, $A=644$, $r=43.2$